REMARKS/ARGUMENTS

On page 3 of the Official Action, claims 1, 8, and 16 were rejected under 35 U.S.C. 102(e) as being anticipated by Kouznetsov et al. U.S. 7,096,501. On page 4 of the Official Action, claims 1-3, 6, 8-10, and 16 were rejected under 35 U.S.C. 102(e) as being anticipated by Smithson. et al. U.S. 6,802,012. On page 5 of the Official Action, claims 1-16 and 18-28 were rejected under 35 U.S.C. 102(e) as being anticipated by McAfee ("GroupShield and the Microsoft Virus Scanning API"). On page 10 of the Official Action, claims 5-7, 12, 24, and 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Smithson in view of McAfee. On pages 11-12 of the Official Action, claim 17 was rejected under 35 U.S.C. 103(a) as being unpatentable over McAfee in view of AAPA; namely, Frank S. Caccavale, Publication No. US-2002-0129277-A1.

In reply to the claim rejections, claims 1-5 have been canceled, claim 6 has been re-written in independent form including all of the limitations of its independent base claim 1 (there being no intervening claims), claims 8-10 have been canceled, claim 11 has been re-written in independent form including all of the limitations of its independent base claim 8 (there being no intervening claims), claims 16-21 have been canceled, and claim 22 has been re-written in independent form including all of the limitations of its independent base claim 16 (there being no intervening claims). Otherwise, applicant respectfully traverses the rejections, for the specific reasons set out below.

The remaining claims are directed generally to operation of a plurality of virus checkers (24, 25, 26 in applicant's FIG. 1). On-demand anti-virus scan requests and on-access anti-virus scan requests are distributed to the virus checkers so that the virus checkers perform on-demand

anti-virus scanning concurrent with on-access anti-virus scanning. "On-access" virus scanning occurs when a specified trigger occurs, such as when a user accesses a file marked "unchecked." (Applicant's specification, page 4, lines 7-8.) "On-demand" virus scanning is typically scheduled when a new virus is discovered, when new unchecked files are migrated to a file server, or prior to archiving or backing-up unchecked files. (Applicant's specification, page 4, lines 8-10.)

The remaining claims are specifically directed to on-demand request chunking (box 67 in applicant's FIG. 3; steps 108-109 in applicant's FIG. 7). For example, outstanding "on-demand" virus scan requests are added to the shared queue when the number of requests in the shared queue falls below a threshold. The threshold is selected to provide a relatively continuous flow of requests to the virus checkers without significantly degrading the response time of the virus checkers for responding to the "on-access" requests. Moreover, it is desirable to add outstanding "on-demand" virus scan requests to the shared queue in manageable "chunks", and to wait until the virus scan requests in each chunk have been serviced before sending another chunk of "on-demand" virus scan requests. (Applicant's specification, page 12, lines 15-23.) The on-demand anti-virus scan requests are grouped into chunks. Each of the chunks includes multiple ones of the on-demand anti-virus scan requests. (Applicant's specification, page 13, lines 13-22; page 16 lines 4-23). In a general case of "N" virus checkers and "M" anti-virus threads, for example, the chunk size is the product (M*N), and the threshold is set to one-half of the chunk size. (Applicant's specification, page 13, lines 20-22.) A near-empty queue threshold (TH1) and a relatively small chunk size will result in the on-demand requests being placed entirely in background during high loading conditions. However, a larger chunk size and a larger queue

threshold will tend to keep the virus checkers busy under diverse loading conditions. (Applicant's specification, page 18, lines 13-17.) The chunking can keep multiple virus checkers busy scanning files in a file system without substantially reducing the availability of the virus checkers for on-access virus checking. (Applicant's specification, page 18 line 22 to page 19 line 6.)

The applicant's claims are not anticipated by Smithson

The remaining claim 6 stands rejected under 35 U.S.C. 102(b) as anticipated by Smithson.

Smithson discloses a method of operating a computer for on-demand anti-virus scanning and on-access virus scanning of computer files. (Smithson, Abstract.) On-demand anti-virus scan requests and on-access anti-virus scan requests are combined in a virus scan request queue. Smithson's virus scan request queue is called a "pending list" in step 18 of Smithson's FIG. 2. This "pending list" is shown in Smithson's FIG. 3 for the case of on-access requests rather than on-demand accesses. (Smithson, col. 5 lines 5-22.) The scan requests in the pending list, however, are not distributed to a plurality of virus checkers. Instead, the scan requests in the pending list are sequentially selected and serviced one at a time in step 24 of Smithson's FIG. 4. (Smithson, col. 5, lines 23-30.) Therefore, at any given time that the Scan Engine 34 of Smithson's FIG. 5 is performing an anti-virus scan, either an on-demand anti-virus scan or an on-access anti-virus scan is being performed by the Scan Engine 34. (Smithson, col. 5, lines 46-54.)

Applicant's claim 6 further recites "grouping the on-demand anti-virus scan requests into chunks, each of the chunks including multiple ones of the on-demand anti-virus scan requests, and placing the chunks onto the virus scan request queue." The placement of chunks of plural on-demand scan requests on the virus scan request queue, instead of individual on-demand scan requests, is shown in applicant's FIG. 7, steps 108, 109, and 110, as described in applicant's specification, page 16 lines 4-8 and 18-23.

With respect to claim 6, page 5 of the Official Action says: "Figure 2 of Smithson teaches placing on-demand scan requests into a queue, Figure 3 shows the 'chunks'." However, Smithson does not disclose "placing the chunks onto the virus scan request queue." Instead, Figure 2 of Smithson shows that one on-demand or on-access scan request is received in step 10 and then written to the virus scan request queue in step 18. Thus, individual scan requests and not chunks of plural scan requests are placed on the virus scan request queue of Smithson. See Smithson Col. 4 line 50 to Col. 5 line 5. Moreover, the "Time Requested" stamps in FIG. 3 are an indication that the plurality of requests shown in the virus scan request queue of FIG. 3 were placed onto the virus scan requests individually at different respective times.

The applicant's claims are not anticipated by McAfee

The remaining claims 6-7, 11-15, and 22-28 stand rejected under 35 U.S.C. 102(e) as being anticipated by McAfee ("GroupShield and the Microsoft Virus Scanning API").

McAfee describes a virus scanning API 2.0 said to have been released as an upgrade to Microsoft Exchange 2000 in Service Pack 1 to provide a number of enhancements including priority based queuing, multithreaded queue processing, and enhanced background scanning. As

a client attempts to gain access to an Exchange item in the Exchange Server, a comparison is made to ensure that the message body and attachment (if present) has been scanned by the current virus signature file. If the content has not been scanned by the current virus signature file, then the corresponding item is submitted to GroupShield for scanning before that item is released to the client. In virus scanning API 2.0, a single queue processes all of the message body and attachment data. On-access requests are submitted as high-priority items. This queue is now serviced by a series of threads (the default number of threads is 2* number_of_processors + 1), with high-priority items always taking precedence. (McAfee, page 3.) Virus scanning API 2.0 also includes on-demand proactive scanning of messages. Items are submitted to a common information store queue as they are submitted to the information store. Each of these items receives a low priority in the queue, so that these items do not interfere with the scanning of the high-priority items. When all of the high-priority items have been scanned, virus scanning API 2.0 begins to scan low-priority items. The priority of items is dynamically upgraded to high priority if a client attempts to access the item when the item is in the low-priority queue. A maximum of 30 items can exist at one time in the low priority queue, which is determined on a first in, first out basis. (McAfee, page 4.)

With respect to "chunks" in McAfee, page 6 and also page 7 of the Official Action says: "Page 3 [of McAfee] shows on-access scan requests being placed within 'chunks' of on-demand scan requests." Applicant respectfully disagrees. Page 3 of McAfee shows (under the heading "Global Scanning Queue") a first box in which "Unscanned items are all placed in the queue with the same priority."; a second box in which "However, if a user accesses an item, it attains a high priority and jumps to the front of the queue."; and a third box in which "If a user saves an

item to a folder, it is given a low priority." (Page 4 further explains that the on-demand requests with the same low priority are maintained as a first-in first-out queue.) Therefore, in applicant's view, the first box on page 3 of McAfee shows the low-priority queue of on-demand scan requests in the Global scanning queue, and the second box shows a scan request being moved from the low-priority queue to the front of the Global Scanning Queue when the scan request is promoted from an on-demand scan request to an on-access scan request. Applicant does not see "grouping the on-demand anti-virus scan requests into chunks, each of the chunks including multiple ones of the on-demand anti-virus scan requests, and placing the chunks onto the virus scan request queue" as recited in applicant's claim 6.

Applicant also does not see where McAfee discloses "inhibiting the distribution of multiple ones of the on-demand anti-virus scan requests from at least one of the chunks to the virus checkers until completion of anti-virus scanning for the anti-virus scan requests in a prior one of the chunks" as recited in Applicant's claim 11. Instead, in McAfee, if an on-demand request is next in line in McAfee's Global Scanning Queue and a scanner thread has just finished using a processor to satisfy an anti-virus scan request, the scanner thread would then begin scanning the on-demand request that is next in line in McAfee's Global Scanning Queue.

Applicant also does not see where McAfee discloses "grouping the on-demand anti-virus scan requests into chunks, each of the chunks including multiple ones of the on-demand anti-virus scan requests, and for each chunk, checking whether the number of anti-virus scan requests on the virus checking queue is less than a threshold, and upon finding that the number of anti-virus scan requests on the virus checking queue is less than the threshold, placing said each chunk on the virus scan request queue" as recited in applicant's claim 12. Instead, in the

proactive scanning of McAfee, when an item is submitted to the information store, an on-demand scan request of the item is placed on the low-priority queue so long as the queue is not full (a maximum of 30 items can exist at one time in the low-priority queue). If an on-demand scan request of the item is not placed on the low-priority queue when an item is submitted to the information store because the queue is full at that time, the item still could be scanned later as a result of background scanning or on-access scanning. In short, in McAfee, individual scan requests and not chunks of plural scan requests are placed on the queue so long as the queue is not full.

Applicant also does not see where McAfee discloses "inhibiting the placement of at least one of the chunks onto the virus scan request queue until completion of anti-virus scanning for the anti-virus scan requests in a prior one of the chunks" as recited in applicant's claims 7 and 15. Applicant respectfully submits that it is unreasonable to interpret "inhibiting the placement of at least one of the chunks onto the virus scan request queue until completion of anti-virus scanning for the anti-virus scan requests in a prior one of the chunks" as simply not placing an individual on-demand scan request on the queue of McAfee if the queue is full. For example, if the low-priority queue of McAfee contains a plurality of scan requests and this plurality of scan requests is considered a chunk (as proposed in the Official Action on page 7 with respect to the independent base claim 12), then in McAfee there is no inhibiting placement of a new on-demand scan request on the low-priority queue of McAfee until the low-priority queue is empty. Instead, so long as the queue is not full, a new on-demand scan request would be placed on the queue of McAfee.

Applicant does not see the chunking feature of applicant's claim 22 in McAfee for the same reasons discussed above with respect to claim 6.

Applicant does not see the chunk placement inhibiting feature of applicant's claim 23 in McAfee for the same reasons discussed above with respect to applicant's claim 7.

Applicant does not see the chunking feature of applicant's claim 24 in McAfee for the same reasons as discussed above with respect to applicant's claim 6.

Applicant does not see the chunk placement threshold feature of applicant's claim 27 in McAfee for the same reasons as discussed above with respect to applicant's claim 12. Placing a chunk of plural on-demand scan requests on a virus scan request queue upon finding that the number of anti-virus scan requests on the virus checking queue is less than a threshold is different from placing an individual on-demand scan request on the queue upon finding that the queue is not full.

Applicant does not see the chunk placement inhibiting feature of applicant's claim 28 in McAfee for the same reasons as discussed above with respect to applicant's claim 7.

The applicant's claims are not obvious from Smithson in view of McAfee

The remaining claims 6-7, 12, and 24 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Smithson in view of McAfee. Applicant respectfully traverses. As discussed above, with respect to claim 6, neither Smithson nor McAfee discloses "grouping the on-demand anti-virus scan requests into chunks, each of the chunks including multiple ones of the on-demand anti-virus scan requests, and placing the chunks onto the virus scan request queue." (Emphasis added.)

As discussed above, with respect to claim 7, neither Smithson nor McAfee discloses "inhibiting the placement of at least one of the chunks onto the virus scan request queue until completion of anti-virus scanning for anti-virus scan requests in a prior one of the chunks." "Inhibiting the placement of at least one of the chunks onto the virus scan request queue until completion of anti-virus scanning for the anti-virus scan requests in a prior one of the chunks" is different from simply not placing an individual on-demand scan request on a queue of scan requests if the queue is full.

Applicant's claim 12 includes the chunk placement feature of applicant's claim 6 and the chunk placement inhibiting feature of applicant's claim 7. Therefore applicant's claim 12 is distinguished from the proposed combination of Smithson and McAfee for the reasons discussed above with respect to applicant's claims 1 and 7.

Applicant's claim 24 includes the chunk placement feature of applicant's claim 6, and therefore is distinguished from the proposed combination of Smithson and McAfee for the reasons discussed above with respect to applicant's claim 6.

In short, neither the chunk placement feature nor the chunk placement inhibiting feature of applicant's claims result from the proposed combination of Smithson and McAfee. Smithson appears entirely satisfactory for its intended purpose of queuing on-access anti-virus requests and on-demand anti-virus requests for giving priority to the on-access requests in a system having a single virus scanner. McAfee also appears entirely satisfactory for its intended purpose of queuing on-access anti-virus requests and on-demand anti-virus requests for giving priority to the on-access requests in a system having multiple processors for anti-virus scanning. There does not appear to be anything in Smithson suggesting modification of McAfee to arrive at applicant's

chunk placement feature or applicant's chunk placement inhibiting feature. There does not appear to be anything in McAfee suggesting modification of Smithson to arrive at applicant's chunk placement feature or applicant's chunk placement inhibiting feature. It also appears that if one were told to modify Smithson in view of McAfee, the result would be similar to McAfee itself. In other words, servicing the queue of Smithson with multiple threads executed by multiple processors is similar to what McAfee discloses.

When determining whether a claim is obvious, an examiner must make "a searching comparison of the claimed invention – including all its limitations – with the teaching of the prior art." In re Ochiai, 71 F.3d 1565, 1572 (Fed. Cir. 1995) (emphasis added). Thus, "obviousness requires a suggestion of all limitations in a claim." CFMT, Inc. v. Yieldup Intern. Corp., 349 F.3d 1333, 1342 (Fed. Cir. 2003) (citing In re Royka, 490 F.2d 981, 985 (CCPA 1974)). Moreover, as the Supreme Court stated, "there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." KSR Int'l v. Teleflex Inc., 127 S. Ct. 1727, 1741 (2007) (quoting In re Kahn, 441 F.3d 977, 988 (Fed. Cir. 2006) (emphasis added)). A fact finder should be aware of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning. See Id., 127 S. Ct. at 1742, citing Graham, 383 U. S. at 36 (warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to "guard against slipping into the use of hindsight.").

The problem that the inventor is trying to solve must be considered in determining whether or not the invention would have been obvious. The invention as a whole embraces the structure, properties and problems it solves. In re Wright, 848 F.2d 1216, 1219, 6 U.S.P.Q.2d 1959, 1961 (Fed. Cir. 1988). Neither Smithson nor McAfee recognizes that there is a problem

with servicing a virus scan request queue that could be or should be solved by the applicant's chunk placement feature or applicant's chunk placement inhibiting feature. As discussed above, by managing on-demand virus scan requests in chunks of plural on-demand requests, the applicant's invention can keep multiple virus checkers busy scanning files in a file system without substantially reducing the availability of the virus checkers for on-access virus checking. This novel advantage of applicant's invention is objective evidence of non-obviousness.

Applicant's New Claims 29-34

Applicant's new claims 29-34 are directed to applicant's preferred chunk size or preferred threshold value, as described in paragraph [00034], lines 18-22 on page 13 of applicant's specification:

> [00034] For example, there are ten anti-virus threads in the anti-virus thread pool 64, there are five virus checkers, and the chunk size is fifty anti-virus file scan requests. The threshold is set to twenty-five. In a more general case of "N" virus checkers and "M" anti-virus threads, for example, the chunk size is the product (M*N), and the threshold is set to one-half of the chunk size.

The chunk size is set by a MAX value in step 109 of applicant's FIG. 7, as further described in applicant's specification on page 16 lines 18-20.

Applicant's new claims 29-34 depend on applicant's claims 12, 24, or 27, respectively, and therefore applicant's new claims 29-34 distinguish the cited references for at least the reasons discussed above with respect to applicant's claims 12, 24, or 27. Moreover, it is

respectfully submitted that neither Kouznetsov, Smithson, nor McAfee alone or in combination suggest the particular chunk size or threshold specified in applicant's new claims 29-34.

In view of the above, it is respectfully submitted that the application is in condition for allowance. Reconsideration and early allowance are earnestly solicited.

Respectfully submitted,

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